JUN 1 3 1996

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 174TH FIGHTER WING (ANG)
6001 EAST MOLLOY ROAD
SYRACUSE, NEW YORK 13211-7099

11 June 1996

MEMORANDUM FOR MR. WILLIAM DAIGLE, P.E.
CHIEF, SPECIAL PROJECTS SECTION
N.Y.S. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD
ALBANY, N.Y. 12233-7010

FROM: 174FW/CC

SUBJECT: CERCAL 104 (e) Review of Hancock Field ANGB, Syracuse, New York

1. Attached you will find our response to the Environmental Protection Agency's (EPA) CERCLA 104 (e) request. Our EPA ID Number is NY3570025475.

2. If you have any questions, please feel free to contact my project manager, Timothy Sager at (DSN) 489-9111 or (315) 454-6111.

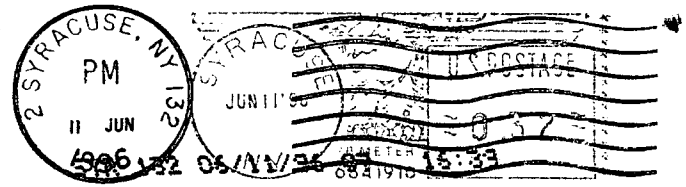
ROBERT A. KNAUFF, LtCol, NYANG
Wing Commander

Attachments:
1. Certification of Answers to Request for Information
2. Report

cc: Robert King - EPA w/atch
James P. Behan, P.E. - TAMS, Inc. w/atch
George A. Shanahan, Esq. - EPA w/o atch
William G. Little, Esq. - NYS-DEC w/o atch
Ruth Lodder - ANGRC/CEVRC w/o atch
N.Y.S. DMNA/MNLA w/o atch

493953

174TH FW/EMO
HANCOCK FLD, ANGB
6001 E MOLLOY RD
SYRACUSE, NY 13211-7099



GEORGE A. SHANAHAN, Esq
Assistant Regional Counsel
U.S. Environmental Protection Agency
290 Broadway, 17th Floor
New Yrok, NY 10007-1866

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AIR NATIONAL GUARD
INSTALLATION RESTORATION PROGRAM

CONFIRMATORY STUDY
PETROLEUM, OIL, LUBRICATION (POL) AREA

for

174th Tactical Fighter Wing
New York Air National Guard
Hancock Field
Syracuse, NY

① PCB's at POL
Area - Spring RI
② Restrict Storage

General Order No. 91B-99791C
Work Release No. K-06

1 September 1994

DRAFT INFORMAL TECHNICAL INFORMATION REPORT

Submitted to:

NATIONAL GUARD BUREAU
ANDREWS AIR FORCE BASE, MARYLAND

Submitted by:

HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
MARTIN MARIETTA ENERGY SYSTEMS, INC.

For the:

U.S. DEPARTMENT OF ENERGY

Prepared by:

METCALF & EDDY
30 Harvard Mill Square
Wakefield, MA 01880

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EXECUTIVE SUMMARY

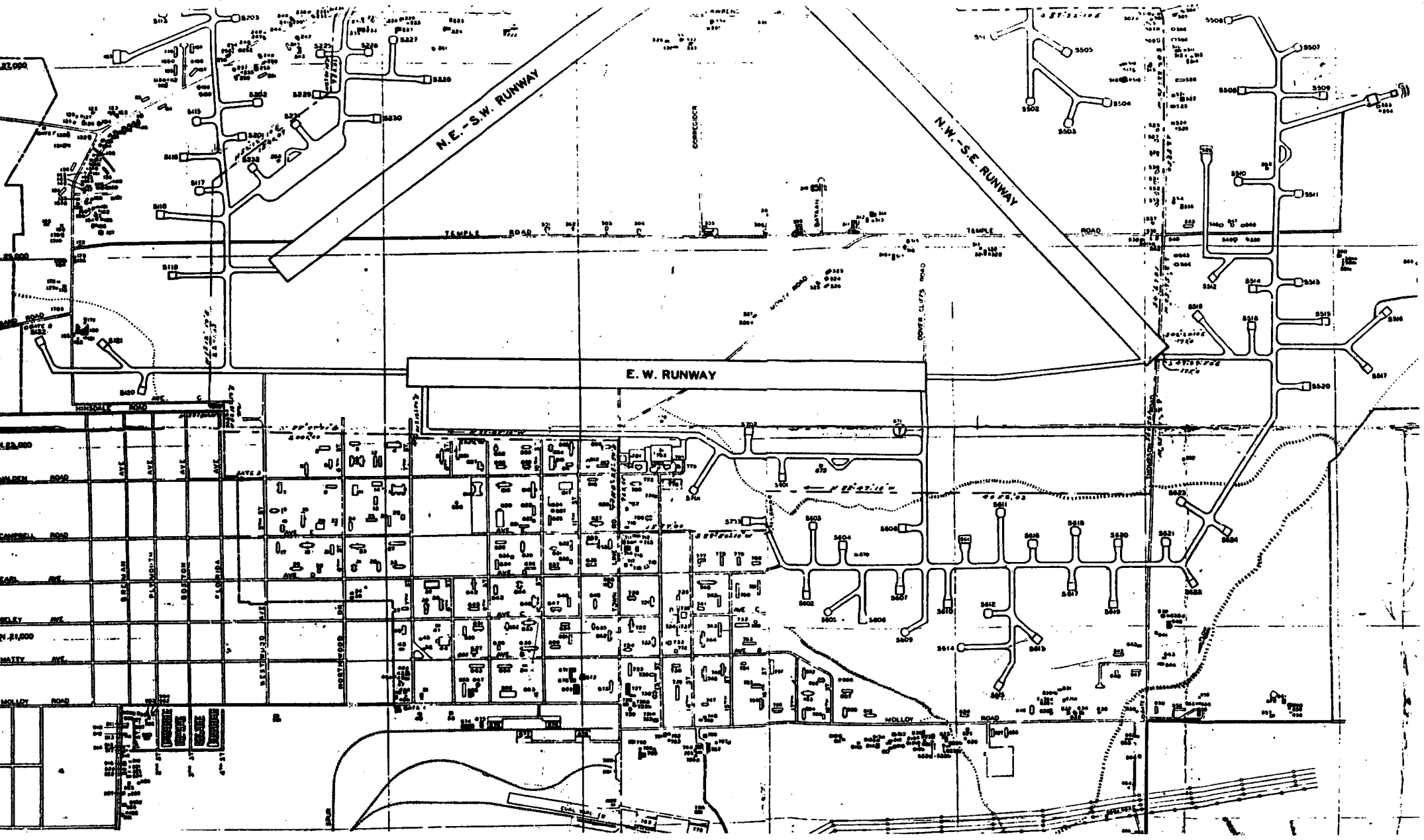
The presence of jet fuel components in the groundwater at the Petroleum, Oil, and Lubrication (POL) Area was confirmed by this study. A limit on migration-to-date of the jet fuel was established, and the contamination has not yet reached all of the existing monitoring wells. This conclusion supports Site Investigation results compiled in 1992. The presence of previously-identified PCBs in the area near the pump house was also confirmed. Although relatively insoluble, PCBs were detected in the groundwater from one monitoring well in the study area.

This confirmatory study work was performed in late June and early July of 1994 at the POL Area of Hancock Field, New York Air National Guard north of Syracuse, New York. This report was prepared for the National Guard Bureau (NGB) under an agreement by which the U.S. Department of Energy provides technical assistance to the NGB.

The POL area is currently the main depot for storage and dispensing of jet fuel at the base. Three potential significant spills have occurred at the POL area, including a release of PCBs prior to the 1980s, a release of an estimated 2,000 gallons of jet fuel in 1990, and a more recent, smaller release of jet propellant in June 1994. All of these releases reportedly occured in the area of the pump house.

There are ten monitoring wells at the site installed as part of previous work. The present study involved sampling groundwater from those ten monitoring wells. Two of the monitoring wells were found damaged. One of these two, the background monitoring well, was deemed unfit to be sampled.

Results from this report will be used to guide the remedial investigation of the POL area currently scheduled for Spring 1995. Recommendations include suggestions for locating and installing future monitoring wells.


N.E.-S.W. RUNWAY
N.W.-S.E. RUNWAY
E. W. RUNWAY
TEMPLE ROAD
COOPER CLIFFS ROAD
MOLLOY ROAD

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

This document summarizes the results of confirmatory study groundwater sampling conducted at the Petroleum, Oil, and Lubricant (POL) Area of the 174th Tactical Fighter Wing (TFW), New York Air National Guard (NYANG) located at Hancock Field in Syracuse, New York. The confirmatory study was conducted under the authority of the Department of Energy (DOE) Hazardous Waste Remedial Actions Program (HAZWRAP) as managed by Martin Marietta Energy Systems (MMES). The technical requirements are described in the scope of work (SOW) provided by MMES. This site is one of two located at Hancock Field which are currently under investigation by Metcalf & Eddy (M&E). The other site, referred to as the Pesticide Storage Area site, will be the subject of a separate document.

The purpose of this document is to summarize the field activities conducted at the POL Area during the confirmatory study, present the results obtained from the sampling and analysis conducted, interpret those results, and provide recommendations to guide the remedial investigation of the site.

1.2 REPORT ORGANIZATION

This document is organized according to IRP guidance (AFCEE, May 1991). It provides the following discussions:

Section 2.0 Project Activities identifies general and site-specific objectives for sampling and analysis as well as a chronology and summary of field work, laboratory analyses, and data validation.

Section 3.0 Sampling and Analysis Results reviews field and analytical data and provides an interpretation of these results.

Section 4.0 Conclusions and Recommendations presents a summary evaluation of findings and makes recommendations for any further site activities.

Section 5.0 References contains the list of references cited throughout the report.

The remainder of **Section 1.0 Introduction** provides a description of the installation and a brief history of investigative activities and findings at the POL Area.

1.3 INSTALLATION DESCRIPTION

Hancock Field, home of the 174th Tactical Fighter Wing (TFW) of the New York Air National Guard (NYANG) is located approximately 5 miles north-northeast of Syracuse, in Onondaga County in central New York, as shown on Figure 1. Hancock Field was built in 1942 as a staging area for warplanes during World War II. Much of the airbase, including the runways, was converted to civilian use as Syracuse Hancock International Airport. The 174th TFW of the NYANG is bordered to the east and south by the town of Dewitt, to the north by the town of Cicero, to the west by the town of Salina, and to the northeast by Syracuse International Airport. The facility encompasses 765 acres (SAIC, 1986) and is situated approximately 415 feet above sea level.

Several documents have discussed in detail background information pertaining to Hancock Field. Specifically:

- The Site Investigation (SI) Management Work Plan (M&E, 1991), section 3.0, provides a description of the installation location and a brief description of each of the two sites under investigation, based on the information available prior to the Site Investigation.
- The SI Field Sampling Plan (M&E, 1991), section 2.0, contains a similar description as well as a summary of investigations conducted at the site prior to the M&E site investigation, and a discussion of the regional geology and hydrogeology.
- The SI Report (M&E, 1992) provides more detail as to the history of land use on both a regional and a site-specific basis. It also provides more detail as to the regional and site-specific geology and hydrogeology discussions presented in sections 2.2 and 4.5.

1.3.1 Site 2 - POL Area

The POL Area is a 2.5 acre (M&E, 1991) section of Hancock Field, NYANG. The layout of the area is shown in Figure 2. The area includes a fuel pumping building, a set of tanks currently containing jet propellant #8 (JP-8), and systems for transferring fuel to and from tanker trucks. There is one large above-ground storage tank, and six underground tanks. Each of the six underground tanks are located under the pump building, with a pipe protruding above the ground surface outside of the building where the depth of the fuel in each tank is measured with a large dipstick.

Three potentially significant spills have occurred in this area. The first was a release of PCBs, presumably from transformers at the southeast end of the pump house, which occurred prior to the 1980s. The second was a release of an estimated 2,000 gallons of jet propellant inside of the pump house in January 1990. Some of the released fuel reportedly flowed out of the doors of the building. The third and most recent spill occurred on June 12, 1994. Approximately 150 gallons of JP-8 was released from tanks located on the northeast side of the building.

The JP-4 spill of 1990 precipitated the installation of four monitoring wells in the area, and four sampling events, involving groundwater, pit wipes and samples from the pump house sump, and soil removed from the spill area. The results of these sampling events indicated the need for further investigation. Consequently, further investigation of the POL area, in the form of a Site Investigation (SI) was undertaken in the fall of 1990. The results of the 1990 SI are summarized below.

Analytical Results. In November and December 1990, PCBs were detected in samples of seepage water taken from inside the pump house and in near-surface soil samples collected from soil borings in the vicinity of the pump house. In the seepage water, positive results were as high as 120 ppb for Aroclor-1260 and 15 ppb for Aroclor-1254. There were

indications that PCBs were present beneath the pump house. Positive results for the subsurface soils ranged from non-detectable to 240,000 ppb for Aroclor-1260. Contamination was greatest at the area immediately south of the building and at the area to the west. The horizontal and vertical extent of the PCB contamination to the south and east of the pump house were not established, nor was the extent of the PCB-contaminated soil beneath the building determined.

Also in 1990, samples of groundwater, seepage from a sump located in the pump house, surface water and sediment were analyzed for jet fuel contamination. Some samples of groundwater, sediment and sump water showed petroleum hydrocarbons consistent with a jet fuel source. No hydrocarbons were detected in the surface water. The results obtained from seepage water samples indicated that there were hydrocarbons beneath the pump house. Groundwater contamination was greatest (2.3 ppm total petroleum hydrocarbons (TPH) and 3,020 ppb total for benzene, toluene, ethylbenzene, and xylene (BTEX)) in MEMW-06, the monitoring well closest to, and down-gradient of the south side of the pump house. For the SI, the contemporary extent of the petroleum contamination in groundwater was defined and contamination was only detected as far south as MW-02 and MW-03.

Geology and Hydrology. Fine grained sediments, typical of a glacial lacustrine depositional environment, were found in this area. Water levels measured from five to ten feet below the ground surface. Groundwater flow was east in the direction of Ley Creek. A groundwater flow contour map is presented in Figure 3. Low hydraulic conductivities and gradients indicated low linear groundwater flow velocities on the order of 3 to 40 ft/year.

Risk Evaluation. A short-term risk evaluation was performed as part of the SI to determine whether remediation of the site could be reasonably postponed until after the base was decommissioned, which was at that time scheduled for 1994. It was felt that it would be more practical and cost-effective to remediate the area after its decommissioning rather than during its active operation. The risk evaluation determined that delaying remediation of the site until after decommissioning was completed would not result in a significant health risk,

so long as precautionary measures are taken, and periodic sampling is conducted.

In March of 1994, HAZWRAP directed M&E to conduct further sampling of the POL area in order to confirm the presence of contamination described in the SI report approximately four years ago. Information obtained during the confirmatory study will be used to plan the Remedial Investigation (RI) of the POL Area scheduled to begin in the Spring of 1995. The site investigation confirmatory study is the subject of this document.

2.0 PROJECT ACTIVITIES

General and site-specific objectives for sampling and analysis are identified in this section.

2.1 PROJECT OBJECTIVES

The objectives of the confirmatory study with respect to the POL Area are as follows:

- Collect and evaluate field data to provide an update on the nature and extent of contamination as previously determined during the SI and in support of a Technical Memorandum
- Collect and evaluate field data in support of the Remedial Investigation

2.2 FIELD ACTIVITIES

Field activities performed by M&E at the POL Area (Site 2) for the confirmatory study by M&E are summarized in this section. Field sampling procedures are described in detail in the Sampling and Analysis Plan (M&E, 1994). Procedures used which differed from the Sampling and Analysis Plan are cited in the field change orders and variance letters attached in Appendix A of this report.

2.2.1 Field Program

This section discusses field work conducted between June 27 and July 2, 1994 only. During this time, all ten of the POL Area monitoring wells were located. Groundwater sampling was conducted at nine of the ten monitoring wells (see Figure 2) to determine the current extent of contamination. Background monitoring well, MEMW-05, was not sampled as its integrity had been severely compromised, and any samples obtained would not have yielded useable data.

Overview of Sampling and Measurement Methods. Upon arriving at each monitoring well, the condition of the well casing was noted. The cover to the well casing was then removed, if present, followed by removal of the PVC cap on the well itself. PID readings of the well headspace were taken as soon as the cap to the PVC was lifted. The condition of the well was again noted. Measurements of the water level and depth to the well bottom were performed for each well in order to calculate the individual well volumes to be purged. Prior to collecting the samples, a minimum of three well volumes was purged. Temperature, pH, and conductivity measurements were taken following the purging of each well volume. The first bailer volume was inspected for free-floating product. A final measurement of the water level in the monitoring well was taken after the samples from that well were collected.

Samples were collected from each well using a disposable Teflon bailer and Teflon-coated leader line attached to a nylon rope. Samples were placed into previously labelled sample bottles and preserved in a manner appropriate to the analysis to be performed. The groundwater samples were submitted for analysis of volatile organic compounds and PCBs by Contract Laboratory Program (CLP) methods, and for total petroleum hydrocarbons (TPH) by the California Modified method. Samples collected for volatile organic analyses were collected first, followed by samples for the other two analyses.

Samples were kept cool in an ice-filled cooler and were subsequently labelled with sample tags and packaged for shipment to the laboratory. Samples were shipped overnight to National Environmental Testing, the contract laboratory.

Description of Record Keeping Procedures. For each monitoring well sampled, a HAZWRAP Monitoring Well Sampling Worksheet was completed with all of the relevant information. In addition, a waterproof field notebook was maintained, and specific information as to chronology, field personnel and visitors, samples collection, instrument calibration and status, phone conversations, and other relevant information according to DOE/HWP-69/RI, "HAZWRAP Quality Control Requirements for Field Methods" (July 1990). A chain of custody form was completed for each sample shipment, with one copy

enclosed in each of the sample coolers, and one copy retained in a 3-ring binder prepared for this purpose.

2.2.2 Chronology of Field Activities

M&E conducted field reconnaissance and groundwater sampling activities at the POL Area between June 27 and July 2, 1994, inclusive.

2.2.3 Field QA/QC

Procedures used in the field were conducted, as described in the confirmatory study Sampling and Analysis Plan (SAP) and the confirmatory study Quality Assurance Project Plan (QAPP) (M&E,1994), and according to HAZWRAP guidance as provided in documents DOE/HWP-65RI, 69RI, and 100. Field procedures which differed from those discussed in the overview of sampling and measurement methods are discussed in the following paragraphs.

The procedure for purging monitoring well MEMW-06 differed from the procedure described above. Slow recharge rates and a shallow depth of standing water were encountered at MEMW-06, resulting in MEMW-06 being purged to dryness. Samples were collected, with the approval of the HAZWRAP representative, over a seven-hour period after the second well volume was removed.

Procedure for purging monitoring well MEMW-09 also differed from the procedure described in the overview of sampling and measurement methods. Because of extremely slow recharge rates at MEMW-09, the well was allowed to recharge overnight after three well volumes were removed. Samples were collected the following morning (07/01/94).

At MEMW-08 and MEMW-09, the procedure for measuring temperature, conductivity, and pH differed from the procedure described in the overview of sampling and measurement. On

06/30/94, excessive moisture caused malfunctions in both the instrument and the backup meter planned for use to measure these parameters. Conductivity was measured at MEMW-08 after the first well volume was removed before the meters became completely inoperable. At this time an estimate of the pH was obtained with pH paper. Temperature was not measured. As no further measurements could be taken, five well volumes were removed prior to sampling to ensure that the samples were representative.

At MEMW-09, measurements could not be taken during purging. All three parameters were measured prior to sampling the next morning. As the results were comparable to those obtained the last time the well was sampled, samples were taken at that time.

Information collected during the confirmatory study sampling concerning the state of the existing monitoring wells is summarized below.

The condition of some of the monitoring wells installed in and around the POL Area had deteriorated since the site investigation was conducted. All of the monitoring wells were flush-mounted. Consequently, those located in areas that are subject to mowing, plowing, and other pedestrian or animal activities suffered varying amounts of damage. Specifically, MEMW-06, which is located close to the paved area of the POL area, was compromised apparently by a lawnmower, a snowplow, or both. The well casing was missing, the well cap dislodged, and the PVC casing disturbed. Although it was likely that some grass and dirt were knocked into the well, the well was sampled.

The integrity of the background monitoring well, MEMW-05, was even more severely compromised. The well casing was found lying in the grass, separate from the well itself, and the well cap was cracked and displaced. A material believed to be bentonite had oozed up around and over the PVC, and had built up in the top of the well itself. In addition, the well cap was covered with animal excrement. As three to four inches of material had actually accumulated inside of the well itself, the well was not sampled.

Bentonite had also surged up around the PVC in monitoring wells MEMW-08 and MEMW-09. In MEMW-08, the material had surged to cover the well cap to a depth of several inches. However, the PVC cap and the lock that secured it were intact. The bentonite was removed from the top and sides of the PVC and cap, and the well was sampled. It was also noted that the PVC rotated freely. In MEMW-09, the bentonite did not reach to the top of the PVC casing, and the well was secured.

The bolts which secure the well casing cap on MW-01 were missing, and there was no lock on the monitoring well cap. Standing water, with a slight sheen, was visible in the shelf on the inside of the metal well casing. Some of the bolts on the remaining monitoring well casings were also damaged, apparently by a lawnmower, but the casing remained secured.

Standing water was also found on the shelf inside of the well casing of MW-02. The casing rotated freely, and hundreds of white bug larvae were visible in the purge water.

The remainder of monitoring wells were found to be secured.

2.3 LABORATORY ANALYSIS

A brief summary of the laboratory program is provided below.

2.3.1 Analytical Program

Groundwater samples were collected from all of the POL Area monitoring wells except MEMW-05, and submitted along with field quality control (QC) samples to National Environmental Testing, Inc. (NET), a laboratory certified by HAZWRAP. NET performed volatile organic and pesticide/PCB analyses by CLP 3/90 methods and total petroleum hydrocarbon (TPH) analyses by the EPA/API Diesel Range Organics (DRO) method, a method similar to the California Modified Method used to analyze for TPH. The DRO method was performed using a JP-4 standard. The primary analytes of concern with respect

to the other two methods performed were BTEX (benzene, toluene, ethylbenzene, and xylene) and PCBs. The analytical results and the quality of those results are discussed in this section.

2.3.2 Chronology of Laboratory Analyses

Samples were collected by M&E on June 28, 29, 30, and July 1. Samples were shipped each night to the laboratory, NET, which received each shipment on the following day. Data was received by M&E from the laboratory on July 25. Data from confirmatory analyses performed by the laboratory with respect to the DRO analyses were received August 17.

2.3.3 QA/QC Program

Quality assurance and quality control (QA/QC) measures, as described in the confirmatory study QAPP, followed guidance provided by HAZWRAP document DOE/HWP-65RI. No out-of-control events were reported by the laboratory.

2.4 DATA EVALUATION

The quality of the analytical data from each of the three analyses performed is summarize in this section. The data validations and tables are presented in Appendix C. Samples were collected from the POL Area, submitted to NET for analysis. For the volatile organic and pesticide/PCB analyses, samples were analyzed according to CLP methods, and validated by M&E. M&E conducted a Level C validation on the analytical data according to DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (July 1990), which was written for the 2/88 Contract Laboratory Program (CLP) Organic Statement of Work (SOW), and incorporated validation actions consistent with the 3/90 Organic SOW. All compounds were validated, although BTEX and PCBs were the main concern.

Samples were also analyzed for jet propellant by NET according to a modified Environmental Protection Agency/American Petroleum Institute (EPA/API) Diesel Range Organics method. M&E conducted a Level C validation on the analytical data according to DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (July, 1990). For the DRO analysis, M&E incorporated validation actions consistent with the GC/FID method used by the laboratory.

Volatile Organic Analyses. Seventeen aqueous samples, including four trip blanks, one equipment blank, and two field blanks (organic-free water and tap water), were collected from the POL Area and submitted for volatile organic analysis. All criteria were met with the following exceptions: 1) holding time criteria was exceeded in one instance, sample FLDQC-TB3-06-30-QC-113, by a period of less than 3 hours; 2) response factors for 1,1,2,2-tetrachloroethane fell below criteria for initial and continuing calibrations on one of the three instruments used, however the compound was not detected at the site and is not a compound of concern (i.e not BTEX) at this site.

With the exception of contaminants found in the tap water field blank, all contaminants were reported at concentrations below the contract required quantitation limits (CRQLs); 4-methyl-2-pentanone (1 μg/L), methylene chloride (2 μg/L), and 1,1,2,2,-tetrachlorethane (1 μg/L). Higher concentrations of contamination were reported in the tap water field blank: chloroform (32 μg/L), bromodichloromethane (16 μg/L), and dibromochloromethane (8 μg/L). These contaminants are most likely artifacts of the chlorination of that water source. None of the contaminants detected are detected in any field samples, nor are any of them compounds of concern at this site.

PCBs. Thirteen aqueous samples, including one equipment blank and two field blanks (organic-free water and tap water), were collected from the POL Area, and submitted to NET for pesticide/PCB analysis. All criteria with the exception of surrogate recovery and confirmatory column precision met the quality control criteria. Qualification of data based upon surrogate recoveries consisted of qualifying all non-detected results in sample MW-001-

06-30-NX-101 as estimated. The positive result for Aroclor-1260 in sample MW-006-06-29-NX-106 was also qualified as estimated; however, this positive result was already estimated because the relative percent difference for recovery of the compound on the two columns was greater than criteria, and because the concentration was below the CRQL.

Diesel Range Organics. Thirteen aqueous samples, including one equipment blank and two field blanks (organic-free water and tap water), were collected from the POL Area, submitted to NET for DRO analysis.

The EPA/API Diesel Range Organics method performed by NET used JP-4 as a standard. Peak areas were integrated over the C8-C15 range defined by that standard. Consequently, the results reported reflect the quantity of jet propellant and fuels of a similar nature, and do not include quantitation of the heavier oils and lubricants. Later eluting peaks, which were not included in the quantitation of the JP-4 concentration, were noticed in the samples from monitoring wells MEMW-06, MW-04, and MW-03. Confirmatory GC/MS analysis performed by the laboratory revealed this pattern of late eluting peaks to be consistent with that resulting from Fuel Oil #6. A rough estimate of the fuel oil concentrations was calculated.

All criteria were met, however some contamination was detected in the equipment blank, FLDQC-EB1-06-29-QC-114. Although the peak pattern of this chromatogram did not match that of the JP-4 standard, the peaks were in the integration range, and a conservative decision to qualify the data was made. As a result of the blank contamination, the result reported for sample MW-003-06-29-NX-103 was qualified as non-detected.

3.0 SAMPLING AND ANALYSIS RESULTS

The sampling and analysis results presented below will be used to interpret data and to develop numerical estimates of risk posed by contaminants at the POL Area.

3.1 REVIEW OF FIELD AND LABORATORY DATA

The data obtained for the confirmatory study conducted at the POL Area consists of concentrations of PCBs and petroleum-related contaminants, specifically BTEX and jet propellant, in the groundwater collected from the POL area monitoring wells. Field data included measurements of groundwater levels, pH, temperature, and conductivity.

The background monitoring well, MEMW-05, was not sampled. Consequently, no information as to current background contamination is available. All other POL area monitoring wells were sampled.

All samples collected were received and analyzed by the laboratory. Analytical data obtained from the laboratory for volatile organic (BTEX) and PCB analyses had few problems. One trip blank was analyzed three hours outside of holding time; the blank results were qualified accordingly.

Analytical data obtained for the DRO analyses for jet propellant had few problems. However, the detection limit was elevated for the results from one monitoring well (MW-03) because of contamination in the equipment blank collected. Additional analyses using GC/MS were conducted to identify contaminants in the DRO analysis which were not attributed to jet propellant.

3.2 DATA SUMMARY

A summary of the field data collected by M&E from the POL Area during the confirmatory study sampling is presented in Table 1. The monitoring well worksheets are located in Appendix B.

Most of the pH readings were within the normal groundwater range (pH 5-8). The pH for MW-03 was higher at pH 8.62. The pH measurements agreed within 20% with those obtained during the SI. This excludes wells MW-03 and MEMW-8, for which final measurements could not be obtained. A pH of 6.9 was reported for the SI for MW-03 and MEMW-08.

With the exception of two monitoring wells, the conductivity readings ranged from 350 to 650 μmhos. The conductivity for MEMW-09 was higher at 1280 μmhos. As this monitoring well is closest to the road, the elevated conductivity could be an indication of road salt and other road runoff. The conductivity for MEMW-06 was also high at 846 μmhos, which could again be a result of it being located near the paved are of the POL area.

Conductivity readings agreed to within 20% of the results obtained during the SI, with the exception of MW-2 (349 μmhos as opposed to 450 μmhos during the SI) and MEMW-10 (535 μmhos as opposed to 760 μmhos during the SI).

3.2.1 Laboratory Results

The analytical results are discussed in this section on a well-by-well basis. The significance of these results is discussed in Section 3.5. Positive sample results for all analyses are presented in Table 2, and are arranged spatially in Figure 4. The results for all compounds, whether detected or not, are presented along with the data validation in Appendix D.

TABLE 1. SUMMARY OF FIELD DATA: POL AREA

WELL LOCATION	DATE SAMPLED	TOC TO BOTTOM (FEET)	TOC TO WATER (FEET)	PID Well (ppm)	RECHARGE	FINAL pH	FINAL COND (umhos)	FINAL TEMP	GROUND WATER APPEARANCE
MW-1	06-30-94	16.56	7.84	386	v. good	6.98	525	61.0	clear; small amounts of black flock; max. bailer PID = 48 ppm
MW-2	06-30-94	13.52	10.96	0	good	7.01	349	57.2	colorless; clear; hundreds of ~1/8" live white larvae
MW-3	06-29-94	13.56	11.06	0	slow	8.62*	647*	59.4*	petroleum odor; slight sheen; clear; black precipitate ~30 s. after removal
MW-4	06-29-94	18.46	11.20	0	slow	8.03	471	62.1	clear w/orange silt
MEMW-6	06-29-94	14.62[1]	12.52[1]	0	ext. slow	7.80	846	64.0	sulfide and petroleum odors (2nd bailer PID=47 ppm); black color; dirt, bug w/1st bailer
MEMW-7	06-28-94	14.52[1]	11.82[1]	1.7	ok	6.96	572	61.5	clear; orange flock precipitate; some silting due to shallowness
MEMW-8	06-30-94	14.82[1]	10.08[1]	0	good	5**	579**	**	clear; colorless; orange silt
MEMW-9	06-30-94	13.32[1]	8.76[1]	0	ext. slow	6.92	1280	62.2	colorless; turbid; silty; brown/black silt
MEMW-10	07-01-94	16.58	7.72	0	ok	7.27	535	60.9	clear; silty; heavy orange silt

NOTES: All wells are overburden wells with 2" internal diameter.

TOC – Top Of Casing

[1] Depths were measured from top of PVC.

* Final not measured due to meter malfunctions. Readings reported from measurement taken after 3rd well volume was removed.

** Final not measured due to meter malfunctions. Readings reported from measurement taken after 1st well volume was removed. Five well volumes purged to ensure representativeness.

TABLE 2. SUMMARY OF DETECTED RESULTS: POL AREA

MONITORING WELL ID: / M&E SAMPLE ID: / COMPOUND	CRQL (µg/L)	MW-1 MW-001-06-30-NX-101	MW-2 MW-002-06-30-NX-102	MW-3 MW-003-06-29-NX-103	MW-4 MW-004-06-29-NX-104	MW-6 MEMW-006-06-29-NX-106
VOLATILE ORGANICS						
Methylene Chloride	10	--	--	--	--	--
1,2-Dichloroethene(total)	10	--	--	19 J	--	--
Chloroform	10	--	--	--	--	--
2-Butanone	10	--	--	--	--	--
Bromodichloromethane	10	--	--	--	--	--
Dibromochloromethane	10	--	--	--	--	--
Benzene	10	--	--	180	--	460
Toluene	10	--	--	--	--	7 J
Ethylbenzene	10	--	480	47 J	--	150
Total Xylenes	10	--	1200	30 J	--	390
PESTICIDES AND PCBs						
Aroclor 1260	1	--	--	--	--	0.62 J
JETFUEL	100	--	3130	--	--	1550
Tentatively Identified Fuel Oil	--	--	--	30**	100**	200**
DATE SAMPLED:		06/30/94	06/30/94	06/29/94	06/29/94	06/29/94
REMARKS:						

MONITORING WELL ID: / M&E SAMPLE ID: / COMPOUND	CRQL (µg/L)	MW-7 MEMW-007-06-28-NX-107	MW-7 DUP MEMW-007-06-28-FD-125	MW-8 MEMW-008-06-30-NX-108	MW-9 MEMW-009-07-01-NX-109	MW-10 MEMW-010-06-30-NX-110
VOLATILE ORGANICS						
Methylene Chloride	10	--	--	--	--	--
1,2-Dichloroethene(total)	10	--	--	--	--	--
Chloroform	10	--	--	--	--	--
2-Butanone	10	--	10	--	--	--
Bromodichloromethane	10	--	--	--	--	--
Dibromochloromethane	10	--	--	--	--	--
Benzene	10	140	160	--	--	--
Toluene	10	6 J	6 J	--	--	--
Ethylbenzene	10	400	420 *	--	--	--
Total Xylenes	10	300	320 *	--	--	--
PESTICIDES AND PCBs						
Aroclor 1260	1	--	--	--	--	--
JETFUEL	100	2890	3150	--	--	--
Tentatively Identified Fuel Oil	--	--	--	--	--	--
DATE SAMPLED:		06/28/94	06/28/94	06/30/94	07/01/94	06/30/94
REMARKS:		Field Duplicate	Field Duplicate			

Footnotes:

CRQL – Contract Required Quantitation Limit.

J – Quantitation is approximate due to limitations identified in the quality control review.

NA – Not Analyzed

UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

U – Value reported is the sample detection limit.

* – Value is reported from the diluted analysis.

** – Concentrations are estimated.

TABLE 2. SUMMARY OF DETECTED RESULTS: POL AREA (continued)

MONITORING WELL ID: / M&E SAMPLE ID: / COMPOUND	CRQL (µg/L)	TRIP BLANK 1 FLDQC-08-28-TB-111	TRIP BLANK 2 FLDQC-TB2-08-29-QC-112	TRIP BLANK 3 FLDQC-TB3-08-30-QC-113	TRIP BLANK 4 FLDQC-TB4-07-01-QC-126	FIELD BLANK DIUF FLDQC-FB1-08-29-QC-115
VOLATILE ORGANICS						
Methylene Chloride	10	1 J	1 J	2 J	--	2 J
1,2-Dichloroethene(total)	10	--	--	--	--	--
Chloroform	10	--	--	--	--	--
2-Butanone	10	--	--	--	--	--
Bromodichloromethane	10	--	--	--	--	--
Dibromochloromethane	10	--	--	--	--	--
Benzene	10	--	--	--	--	--
Toluene	10	--	--	--	--	--
Ethylbenzene	10	--	--	--	--	--
Total Xylenes	10	--	--	--	--	--
PESTICIDES AND PCBs						
Aroclor 1260	1	NS	NS	NS	NS	--
JETFUEL	100	NS	NS	NS	NS	--
Tentatively Identified Fuel Oil	--	NS	NS	NS	NS	--
DATE SAMPLED:		06/28/94	06/29/94	06/30/94	07/01/94	06/29/94
REMARKS:		Trip Blank	Trip Blank	Trip Blank	Trip Blank	Field Blank

MONITORING WELL ID: / M&E SAMPLE ID: / COMPOUND	CRQL (µg/L)	FIELD BLANK TAP FLDQC-FB2-08-30-QC-116	EQUIPMENT BLANK FLDQC-EB1-08-29-QC-114
VOLATILE ORGANICS			
Methylene Chloride	10	--	--
1,2-Dichloroethene(total)	10	--	--
Chloroform	10	32	--
2-Butanone	10	--	--
Bromodichloromethane	10	16	--
Dibromochloromethane	10	8 J	--
Benzene	10	--	--
Toluene	10	--	--
Ethylbenzene	10	--	--
Total Xylenes	10	--	--
PESTICIDES AND PCBs			
Aroclor 1260	1	--	--
JETFUEL	100	--	113
Tentatively Identified Fuel Oil	--	--	--
DATE SAMPLED:		06/30/94	06/29/94
REMARKS:		Field Blank	Equipment Blank

Footnotes:

CRQL – Contract Required Quantitation Limit.

J – Quantitation is approximate due to limitations identified in the quality control review.

NA – Not Analyzed

UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

U – Value reported is the sample detection limit.

* – Value is reported from the diluted analysis.

** – Concentrations are estimated.

MW-01. No positive results were detected for BTEX, PCBs or jet propellant in any of the three analyses performed, although PID readings of 390 ppm and 50 ppm were obtained in the well headspace and bailer headspace, respectively. No free product or sheen was observed.

MW-02. Ethylbenzene was reported at 480 μg/L and total xylenes were reported at 1200 μg/L. Several aliphatic and aromatic compounds from C6 through C9 were tentatively identified in the volatile organic analysis. The estimated total TIC concentration, which consisted primarily of aromatic compounds, was 2000 μg/L. Jet propellant concentration was reported at 3130 μg/L. No PCBs were detected.

MW-03. Benzene was detected at 180 μg/L, ethylbenzene at 47 μg/L, and total xylenes at 30 μg/L. Cyclohexane was tentatively identified at an estimated concentration of 70 μg/L. The detection limit for the jet propellant analysis was elevated (376 μg/L) due to equipment blank contamination. A concentration of 30 μg/L of fuel oil #6 was estimated. PCBs were not detected.

MW-04. No volatile organics, jet propellant, or PCBs were detected in this sample. However, a concentration of approximately 100 μg/L of fuel oil #6 was tentatively identified by GC/MS analysis as discussed in the section on DRO data quality.

MEMW-05. As discussed in the section on field data, this background monitoring well was not sampled as the integrity of the well was severely compromised, and the sample collected would not have been representative of groundwater conditions.

MEMW-06. Benzene (460 μg/L), toluene (7 μg/L), ethylbenzene (150 μg/L), and total xylenes (390 μg/L) were all detected. The toluene concentration was estimated (J) as it was below the quantitation limit. Volatile organic TICs detected consisted largely of aromatic compounds, and concentrations totalled 300 μg/L. Jet propellant was detected at 1550 μg/L, and approximately 200 μg/L of Fuel Oil #6 was reported. While PID readings from the well

headspace were 0 ppm, readings obtained from the bailer headspace were as high as 47 ppm. Aroclor-1260 was estimated at a concentration of 0.62 μg/L, below the quantitation limit (1 μg/L). The PCB result was also estimated due to low surrogate recovery and poor precision with the confirmatory column. Thus this result may be biased low. This was the only PCB detected in any of the samples collected.

MEMW-07. The field duplicate was collected at this monitoring well. Positive results were reported for benzene (140 μg/L and 160 μg/L), toluene (6 μg/L and 6 μg/L), ethylbenzene (400 μg/L and 420 μg/L), and total xylenes (300 μg/L and 320 μg/L) were reported for volatile organics. 2-Butanone was detected at the quantitation limit at 10 μg/L in one sample, and was undetected in the other. Jet propellant was detected at similar concentrations (2890 μg/L and 3150 μg/L) in both samples. PID readings were obtained from the well headspace at 2 ppm. No PCBs were detected.

MEMW-08. No positive results were detected for any of the three analyses performed.

MEMW-09. No positive results were detected for any of the three analyses performed.

MEMW-10. No positive results were detected for any of the three analyses performed.

3.2.2 Comparison of Field and Laboratory Data

PID readings indicted the presence of volatile organic gases in the headspace of two monitoring wells, MW-01 (390 ppm) and MEMW-07 (2 ppm). While contamination was reported by the laboratory for the sample from MEMW-07, none was reported for the sample from MW-01. It is possible that the most recent spill of JP-8, which flowed out of tanks under the northeast side of the pump house, has saturated the soil in the vicinity the monitoring well, but has not yet reached the groundwater. This would likely result in elevated PID readings in the vadose zone with no detection in the groundwater.

3.3 BACKGROUND LEVELS

No current information with respect to background levels of contamination could be obtained as the integrity of the background monitoring well, MEMW-05, was severely compromised and could not be sampled. Background samples from MEMW-05 taken in 1990 did not indicate any jet propellant detections. As noted above, SI groundwater samples were not analyzed for PCBs.

3.4 IDENTIFICATION OF SITE CONTAMINANTS

Groundwater contaminants identified during the confirmatory study include BTEX, PCBs, and hydrocarbons indicative of jet propellant. Fuel oil #6 was also tentatively identified as a contaminant. The spatial distribution of the contaminant concentrations detected in each of the monitoring wells sampled is presented in Figure 4.

3.4.1 Petroleum Contamination

Contamination related to petroleum was detected in the monitoring wells immediately to the southeast of the pump house (MEMW-06 and MEMW-07), and extends in that direction as far as the POL Area fence (MW-02 and MW-03), but not as far as the monitoring wells beyond the POL area (MEMW-08, MEMW-09, and MEMW-10). With the possible exception of MW-04, the petroleum related contamination was not indicated beyond the four central monitoring wells (MEMW-06, MEMW-07, MW-02, and MW-03).

Petroleum-related contamination was detected as far south as MW-03. To the west, the extent of the contamination associated with jet propellant has not yet extended as far MW-04, however fuel oil #6 was tentatively identified in samples from this monitoring well. To the north of the pump house, groundwater contamination was not indicated in MW-01, however PID readings taken at the well headspace suggest that petroleum-related contaminants may be present in the soil in the vicinity of the monitoring well. To the east, contamination was

detected as far as monitoring wells MEMW-07 and MW-02, but not as far east as MEMW-10.

The greatest concentrations of contaminants associated with the petroleum contamination were reported for the monitoring wells directly to the southeast and downgradient of the pump house, MEMW-06, MEMW-07, and farther southeast at MW-02.

As noted above, fuel oil #6 was tentatively identified at MW-04 at an estimated concentration of 100 μg/L. It was also tentatively identified at MW-03 at a lower estimated concentration (70 μg/L), and at MEMW-06 at a higher estimated concentration (200 μg/L).

BTEX. BTEX was detected in the monitoring wells immediately southeast of the pump house in MEMW-06 and MEMW-07. Concentrations for BTEX were 1000 ppb for MEMW-06 and 880 ppb for MEMW-07. In addition, approximately 300 ppb of tentatively identified volatile aromatics, also indicative of petroleum contamination, were detected in MEMW-06.

Farther to the south, BTEX was detected in MW-02 and MW-03 at 1700 ppb and 260 ppb, respectively. In addition, a concentration of approximately 2000 ppb was reported for tentatively identified volatile aromatics in the sample from MW-02. The BTEX concentration detected in the sample from MW-02 was the highest concentration reported for the site.

BTEX was not detected in the monitoring wells south of the southern fence of the POL area, (MEMW-08, MEMW-09, and MEMW-10), nor was it detected in MW-04 to the west, nor MW-01 to the north.

Jet Propellant. Jet propellant was detected in the same monitoring wells as BTEX with the exception of MW-03, which had an elevated detection limit. Jet propellant was not detected in any monitoring well which did not have BTEX contamination. Jet propellant

concentrations were highest in MEMW-07 and MW-02 at 3020 ppb and 3130 ppb, respectively. Jet propellant concentrations at MEMW-06 were roughly half that amount (1550 ppb).

Fuel Oil #6. It should be noted that fuel oil #6 was only tentatively identified and the concentrations are estimated. Fuel oil #6 was tentatively identified at MW-03, MW-04, and MEMW-06. At MW-04, where no BTEX or jet propellant was reported, the concentration was estimated at 100 μg/L. The estimated concentration was lower at MW-03 (30 μg/L), and higher at MEMW-06 (200 μg/L).

3.4.2 PCB Contamination

PCB contamination was only detected in MEMW-06. The PCB mixture Aroclor-1260 was detected in the groundwater from this monitoring well, which is the closest monitoring well to the southeast side of the pump house. PCBs were not detected in any other monitoring well.

3.5 TREND ANALYSIS/COMPARISON TO SI RESULTS

This section compares both jet propellant and PCB contamination found during the confirmatory study with those results reported for samples collected during the 1990 site investigation.

3.5.1 Jet Propellant Contamination

A comparison of the contaminant concentrations detected in groundwater samples collected in December 1990 (M&E, 1992) and those reported for the confirmatory study indicate that contaminant concentrations have changed somewhat over time. Figure 5 provides a visual comparison of the BTEX and jet propellant concentrations from the two sampling events. Each monitoring well in Figure 5 is labelled with the concentrations detected in the 1994

confirmatory study followed by the concentrations from the 1990 SI. Note that the number to the left of the backslash is from the confirmatory study, the number to the right is from the SI (CS/SI). Figure 3 displays the site groundwater contour map, which is useful in this discussion.

As discussed in the data evaluation section, results from the analytical method performed for the confirmatory study to analyze for jet propellant contamination is a more specific method than the TPH method which was performed for the SI. In addition, the detection limit for the SI TPH method was higher (1000 ppb), than the detection limit for the DRO method (100 ppb). Consequently, the results are not directly comparable.

Contamination was detected in the same monitoring wells as in the SI (MEMW-06, MEMW-07, MW-03, and MW-02) with the exception of MW-01. Contamination was still not detected as far downgradient as monitoring wells MEMW-08, MEMW-09, MEMW-10. Contamination related to jet propellant was still not identified in MW-04, however Fuel Oil #6 was tentatively identified in the most recent sampling event.

As noted above, no contamination was reported for MW-01, however the BTEX result for monitoring well MW-01 was 700 μg/L in 1990, and the TPH concentration was 1,000 μg/L.

Contaminant concentrations increased in MEMW-07 and MW-02. BTEX contamination increased by more than a factor of two at both wells (MEMW-07: 384 μg/L to 840 μg/L, MW-02: 670 μg/L to 1680 μg/L). The concentration of jet propellant reported was three times higher than the TPH results of 1990 for both monitoring wells. TPH was not detected at MEMW-07 in 1990, however the detection limit was 1000 μg/L. In comparison, the jet propellant concentration was 3020 μg/L. For MW-02, results went from 1000 μg/l to 3130 μg/L.

Contaminant concentrations decreased in MEMW-06 and MW-03. BTEX concentrations decreased in MEMW-06 by a factor of three. Jet propellant concentration was less than the

TPH concentration reported in the SI (2300 μg/L vs 1550 μg/L). For MW-03, BTEX concentrations decreased by less than a factor of two from 428 μg/L to 257 μg/L.

3.5.2 PCB Contamination

One positive detection was reported for PCBs: Aroclor-1260 was reported as estimated for MEMW-06 at 0.62 μg/L. MEMW-06 is the monitoring well closest to and directly downgradient from the front of pump house, where the PCB spill occurred, and is therefore the well most likely to indicate PCB contamination. Groundwater monitoring samples collected during the SI were not analyzed for PCBs. However, purge water from the development of MEMW-06 was analyzed for PCBs, and 1.6 μg/L of Aroclor-1260 was reported from this analysis (M&E, 1992).

4.0 CONCLUSIONS AND RECOMMENDATIONS

The data presented in the previous sections are presented below, along with an identification of future work recommended for the site.

4.1 CONCLUSIONS

It is evident from the data summary and the associated figures that the jet propellant contamination has changed somewhat since the SI samples were collected in late 1990. With the possible exception of MW-01, the results from samples collected from each monitoring well did not change by more than a factor of 2 or 3. As MW-01 is slightly upgradient of the front half from the pump house and the pump house door, it is possible that the contaminant plume has moved past this monitoring well.

Monitoring wells directly south of the pump house, MEMW-06 and MW-03, are showing slightly less contamination than reported for the SI. MW-04, farther to the west, is still not showing any contamination. These monitoring wells are not directly downgradient of the front of the pump house. Given this, the east-southeast direction of groundwater flow, and low flow velocities, it is suggested that contamination has diminished over time. Less contaminated groundwater is expected to flow in from areas west of the pump house, slowly pushing the plume in the direction of groundwater flow.

Monitoring wells farther to the east and closer to Ley Creek, MEMW-07 and MW-02, are showing an increase in contaminant levels. This would indicate that the plume has intensified slightly in the direction immediately downgradient of the front of the pump house (MEMW-07), and in the area farther downgradient (MW-02).

The fact that the outer-most monitoring wells, MEMW-08, MEMW-09, and MEMW-10, still show no contamination indicates that the jet propellant plume has not migrated to this extent, and still remains within the boundaries of the base property.

With respect to PCB contamination, the detection of Aroclor-1260 in MEMW-06 is consistent with PCB contamination reported in soil samples collected from shallow soil borings in the vicinity of the front of the pump house during the SI. In addition, analyses of sampling and drilling wastes from the installation of MEMW-06 indicated high concentrations (2,700 μg/kg) of Aroclor-1260 in the drummed soil cuttings, and 1.6 μg/L PCB in the purge and development water (M&E, 1992).

4.2 RECOMMENDATIONS

This section consists of recommendations, based upon the information provided by the CS, to facilitate further investigation of the POL area, specifically the Remedial Investigation currently scheduled to be conducted at the POL Area in the Spring of 1995.

4.2.1 PCB Contamination

The information provided by this study with respect to PCB contamination at the POL area is very limited, but would suggest that contamination remains on-site at a level requiring further attention. Establishing the limits of the PCB contamination around the pump house, and should be one of the goals of the RI. Furthermore, each of the soil samples collected should be analyzed for both jet propellant contamination and PCB contamination. As there is interaction between the two contaminants, apparently leading to increased mobility of PCBs, this information is necessary to help predict movement of the PCBs into groundwater.

4.2.2 Placement of Additional Monitoring Wells

As the monitoring wells farthest downgradient are not showing contamination at this time, the installation of additional monitoring wells beyond MEMW-08, MEMW-09, and MEMW-10. Rather, efforts should be taken to better define the extent of the contamination to the east and southeast of the pump house.

4.2.3 Flush-Mounted Wells

Whenever possible, monitoring wells installed in or around the POL area in the future should not be flush-mounted. In addition, those monitoring wells already installed should either be marked and protected by a concrete post, or fitted with new well casings that stick up. Locating flush-mounted monitoring wells that are installed in woods and other heavily vegetated areas is time-consuming. Those monitoring wells that are located in the lawn areas are frequently damaged by lawnmowers and, if close enough to the pavement, by snow plows. It is necessary to maintain the integrity of these wells to obtain reliable data. Since replacement of monitoring wells is expensive, time consuming, and inefficient, every effort must be made to protect these investments.

5.0 REFERENCES

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U.S. EPA, 1993. *Contract Laboratory Program, Statement of Work for Organics Analysis: Multi-Media, Multi-Concentration, Revisions through OLM01.9*, July, 1993.

Table I: Recommendation Summary
for Volatile Organic Analyses Performed on Groundwater Samples
Hancock Field, NYANG, Syracuse, NY

Sample No.	Action
MW-001-06-30-NX-101	A
MW-002-06-30-NX-102	A
MW-003-06-29-NX-103	R^1,R^2
MW-004-06-29-NX-104	R^1,R^2
MEMW-006-06-29-NX-106	R^1,R^2
MEMW-007-06-28-NX-107	A
MEMW-007-06-28-FD-125	R^1,R^2
MEMW-007-06-28-FD-125DL	R^1,R^2
MEMW-008-06-30-NX-108	A
MEMW-009-07-01-NX-109	A
MEMW-010-06-30-NX-110	A
FLDQC-06-28-TB-111	R^1
FLDQC-TB2-06-29-QC-112	R^1,R^2
FLDQC-TB3-06-30-QC-113	J^1
FLDQC-TB4-07-01-QC-126	A
FLDQC-FB1-06-29-QC-115	R^1,R^2
FLDQC-FB2-06-30-QC-116	A
FLDQC-EB1-06-29-QC-114	R^1,R^2

A - Accept all data.

J^1 - Qualify as estimated (UJ) all non-detected results due to analysis outside of holding time.

R^1 - Reject (R) the non-detected results for 1,1,2,2-Tetrachloroethane due to low average RRF in the initial calibration.

R^2 - Reject (R) the non-detected results for 1,1,2,2-Tetrachloroethane due to low RRFs in the continuing calibration.

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		106026	106027	105996	105992	105994
M&E SAMPLE ID:		MW-001-06-30-NX-101	MW-002-06-30-NX-102	MW-003-06-29-NX-103	MW-004-06-29-NX-104	MEMW-006-06-29-NX-106
COMPOUND	CRQL					
Chloromethane	10	10 U	100 U	100 U	10 U	50 U
Bromomethane	10	10 U	100 U	100 U	10 U	50 U
Vinyl Chloride	10	10 U	100 U	100 U	10 U	50 U
Chloroethane	10	10 U	100 U	100 U	10 U	50 U
Methylene Chloride	10	10 U	100 U	100 U	10 U	50 U
Acetone	10	10 U	100 U	100 U	10 U	50 U
Carbon Disulfide	10	10 U	100 U	100 U	10 U	50 U
1,1-Dichloroethene	10	10 U	100 U	100 U	10 U	50 U
1,1-Dichloroethane	10	10 U	100 U	19 J	10 U	50 U
1,2-Dichloroethene(total)	10	10 U	100 U	100 U	10 U	50 U
Chloroform	10	10 U	100 U	100 U	10 U	50 U
1,2-Dichloroethane	10	10 U	100 U	100 U	10 U	50 U
2-Butanone	10	10 U	100 U	100 U	10 U	50 U
1,1,1-Trichloroethane	10	10 U	100 U	100 U	10 U	50 U
Carbon Tetrachloride	10	10 U	100 U	100 U	10 U	50 U
Bromodichloromethane	10	10 U	100 U	100 U	10 U	50 U
1,2-Dichloropropane	10	10 U	100 U	100 U	10 U	50 U
cis-1,3-Dichloropropene	10	10 U	100 U	100 U	10 U	50 U
Trichloroethene	10	10 U	100 U	100 U	10 U	50 U
Dibromochloromethane	10	10 U	100 U	100 U	10 U	460
1,1,2-Trichloroethane	10	10 U	100 U	180	10 U	50 U
Benzene	10	10 U	100 U	100 U	10 U	50 U
trans-1,3-Dichloropropene	10	10 U	100 U	100 U	10 U	50 U
Bromoform	10	10 U	100 U	100 U	10 U	50 U
4-Methyl-2-pentanone	10	10 U	100 U	100 U	10 U	7 J
2-Hexanone	10	10 U	100 U	100 U	10 U	R
Tetrachloroethene	10	10 U	100 U	R	R	50 U
Toluene	10	10 U	100 U	100 U	10 U	150
1,1,2,2-Tetrachloroethane	10	10 U	100 U	47 J	10 U	50 U
Chlorobenzene	10	10 U	480	100 U	10 U	390
Ethylbenzene	10	10 U	100 U	30 J	10 U	
Styrene	10	10 U	1200			
Total Xylenes	10					
DILUTION FACTOR:		1	10	10	1	5
DATE SAMPLED:		06/30/94	06/30/94	06/29/94	06/29/94	06/29/94
DATE ANALYZED:		07/09/94	07/09/94	07/05/94	07/05/94	07/06/94
REMARKS:						

Footnotes:

- CRQL – Contract Required Quantitation Limit.
- J – Quantitation is approximate due to limitations identified in the quality control review.
- U – Value reported is the sample detection limit.
- R – Value is rejected.
- UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
- * – Value is reported from the diluted analysis.

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105915	105916	106029	106087	106026
M&E SAMPLE ID:		MEMW-007-06-28-NX-107	MEMW-007-06-28-FD-125	MEMW-008-06-30-NX-108	MEMW-009-07-01-NX-109	MEMW-010-06-30-NX-110
COMPOUND	CRQL					
Chloromethane	10	50 U	10 U	10 U	10 U	10 U
Bromomethane	10	50 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10	50 U	10 U	10 U	10 U	10 U
Chloroethane	10	50 U	10 U	10 U	10 U	10 U
Methylene Chloride	10	50 U	10 U	10 U	10 U	10 U
Acetone	10	50 U	10 U	10 U	10 U	10 U
Carbon Disulfide	10	50 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	50 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	50 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene(total)	10	50 U	10 U	10 U	10 U	10 U
Chloroform	10	50 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	50 U	10	10 U	10 U	10 U
2-Butanone	10	50 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10	50 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	50 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10	50 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	50 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	50 U	10 U	10 U	10 U	10 U
Trichloroethene	10	50 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10	50 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	140	160	10 U	10 U	10 U
Benzene	10	50 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	50 U	10 U	10 U	10 U	10 U
Bromoform	10	50 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	50 U	10 U	10 U	10 U	10 U
2-Hexanone	10	50 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10	6 J	6 J	10 U	10 U	10 U
Toluene	10	R	R	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	50 U	10 U	10 U	10 U	10 U
Chlorobenzene	10	400	420 *	10 U	10 U	10 U
Ethylbenzene	10	50 U	10 U	10 U	10 U	10 U
Styrene	10	300	320 *	10 U	10 U	10 U
Total Xylenes	10					
DILUTION FACTOR:		5	5	1	1	1
DATE SAMPLED:		06/28/94	06/28/94	06/30/94	07/01/94	06/30/94
DATE ANALYZED:		07/01/94	07/06/94	07/09/94	07/07/94	07/09/94
REMARKS:		Field Duplicate of 105916	Field Duplicate of 105915			

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
* – Value is reported from the diluted analysis.

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105917	105997	106031	106088	105993
M&E SAMPLE ID:		FLDQC-06-28-TB-111	FLDQC-TB2-06-29-QC-112	FLDQC-TB3-06-30-QC-113	FLDQC-TB4-07-01-QC-128	FLDQC-FB1-06-29-QC-115
COMPOUND	CRQL					
Chloromethane	10	10 U	10 U	10 UJ	10 U	10 U
Bromomethane	10	10 U	10 U	10 UJ	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 UJ	10 U	10 U
Chloroethane	10	10 U	10 U	10 UJ	10 U	10 U
Methylene Chloride	10	1 J	1 J	2 J	10 U	2 J
Acetone	10	10 U	10 U	10 UJ	10 U	10 U
Carbon Disulfide	10	10 U	10 U	10 UJ	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 UJ	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloroethene(total)	10	10 U	10 U	10 UJ	10 U	10 U
Chloroform	10	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
2-Butanone	10	10 U	10 U	10 UJ	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 UJ	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 UJ	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 UJ	10 U	10 U
Trichloroethene	10	10 U	10 U	10 UJ	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 UJ	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
Benzene	10	10 U	10 U	10 UJ	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 UJ	10 U	10 U
Bromoform	10	10 U	10 U	10 UJ	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 UJ	10 U	10 U
2-Hexanone	10	10 U	10 U	10 UJ	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 UJ	10 U	10 U
Toluene	10	10 U	10 U	10 UJ	10 U	10 U
1,1,2,2-Tetrachloroethane	10	R	R	10 UJ	10 U	R
Chlorobenzene	10	10 U	10 U	10 UJ	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 UJ	10 U	10 U
Styrene	10	10 U	10 U	10 UJ	10 U	10 U
Total Xylenes	10	10 U	10 U	10 UJ	10 U	10 U
DILUTION FACTOR:		1	1	1	1	1
DATE SAMPLED:		06/28/94	06/29/94	06/30/94	07/01/94	06/29/94
DATE ANALYZED:		07/01/94	07/06/94	07/14/94	07/07/94	07/07/94
REMARKS:		Trip Blank	Trip Blank	Trip Blank	Trip Blank	Field Blank

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
* – Value is reported from the diluted analysis.

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		106030	105995
M&E SAMPLE ID:		FLDQC-FB2-06-30-QC-116	FLDQC-EB1-06-29-QC-114
COMPOUND	CRQL		
Chloromethane	10	10 U	10 U
Bromomethane	10	10 U	10 U
Vinyl Chloride	10	10 U	10 U
Chloroethane	10	10 U	10 U
Methylene Chloride	10	10 U	10 U
Acetone	10	10 U	10 U
Carbon Disulfide	10	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U
1,2-Dichloroethene(total)	10	32	10 U
Chloroform	10	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U
2-Butanone	10	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U
Carbon Tetrachloride	10	16	10 U
Bromodichloromethane	10	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U
Trichloroethene	10	8 J	10 U
Dibromochloromethane	10	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U
Benzene	10	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U
Bromoform	10	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U
2-Hexanone	10	10 U	10 U
Tetrachloroethene	10	10 U	10 U
Toluene	10	10 U	R
1,1,2,2-Tetrachloroethane	10	10 U	10 U
Chlorobenzene	10	10 U	10 U
Ethylbenzene	10	10 U	10 U
Styrene	10	10 U	10 U
Total Xylenes	10	10 U	
DILUTION FACTOR:		1	1
DATE SAMPLED:		06/30/94	06/29/94
DATE ANALYZED:		07/08/94	07/05/94
REMARKS:		Field Blank	Equipment Blank

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
* – Value is reported from the diluted analysis.

Table I: Recommendation Summary
for Diesel Range Organic Analyses Performed on Groundwater Samples
Hancock Field, NYANG, Syracuse, NY

Sample No.	Action
MW-001-06-30-NX-101	A
MW-002-06-30-NX-102DL	A
MW-003-06-29-NX-103	A^1
MW-004-06-29-NX-104	A
MEMW-006-06-29-NX-106	A
MEMW-007-06-28-NX-107DL	A
MEMW-007-06-28-FD-125	A
MEMW-008-06-30-NX-108	A
MEMW-009-07-01-NX-109	A
MEMW-010-06-30-NX-110	A
FLDQC-FB1-06-29-QC-115	A
FLDQC-FB2-06-30-QC-116	A
FLDQC-EB1-06-29-QC-114	A

A - Accept all data.

A^1 - Qualify as undetected (U) due to contamination in the equipment blank.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		106026	106027	105996	105992
M&E SAMPLE ID:		MW-001-06-30-NX-101	MW-002-06-30-NX-102	MW-003-06-29-NX-103	MW-004-06-29-NX-104
COMPOUND	QL (µg/L)				
Jet Propellant	100	97 U	3130	376 U	118 U
DILUTION FACTOR:		1	2	1	1
DATE SAMPLED:		06/30/94	06/30/94	06/29/94	06/29/94
DATE EXTRACTED:		07/05/94	07/05/94	07/01/94	07/01/94
DATE ANALYZED:		07/09/94	07/13/94	07/11/94	07/09/94
REMARKS:		-----	-----	-----	-----

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID: / M&E SAMPLE ID:		105994 MEMW-006-06-29-NX-106	105915 MEMW-007-06-28-NX-107	105916 MEMW-007-06-28-FD-125	106029 MEMW-008-06-30-NX-108
COMPOUND	QL (µg/L)				
Jet Propellant	100	1550	2890	3150	97 U
DILUTION FACTOR:		1	1	2	1
DATE SAMPLED:		06/29/94	06/28/94	06/28/94	06/30/94
DATE EXTRACTED:		07/01/94	07/01/94	07/01/94	07/05/94
DATE ANALYZED:		07/11/94	07/09/94	07/13/94	07/09/94
REMARKS:		-----	Field Duplicate of 105916	Field Duplicate of 105915	-----

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID: / M&E SAMPLE ID:		106087 MEMW-009-07-01-NX-109	106028 MEMW-010-06-30-NX-110	105993 FLDQC-FB1-06-29-QC-115	106030 FLDQC-FB2-06-30-QC-116
COMPOUND	QL (µg/L)				
Jet Propellant	100	112 U	101 U	114 U	108 U
DILUTION FACTOR:		1	1	1	1
DATE SAMPLED:		07/01/94	06/30/94	06/29/94	06/30/94
DATE EXTRACTED:		07/05/94	07/05/94	07/01/94	07/05/94
DATE ANALYZED:		07/09/94	07/09/94	07/11/94	07/09/94
REMARKS:		-----	-----	Field Blank	Field Blank

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105995
M&E SAMPLE ID:		FLDQC-EB1-06-29-QC-114
COMPOUND	QL (µg/L)	
Jet Propellant	100	113
DILUTION FACTOR:		1
DATE SAMPLED:		06/29/94
DATE EXTRACTED:		07/01/94
DATE ANALYZED:		07/11/94
REMARKS:		-----

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

LIST OF ACRONYMS AND ABBREVIATIONS

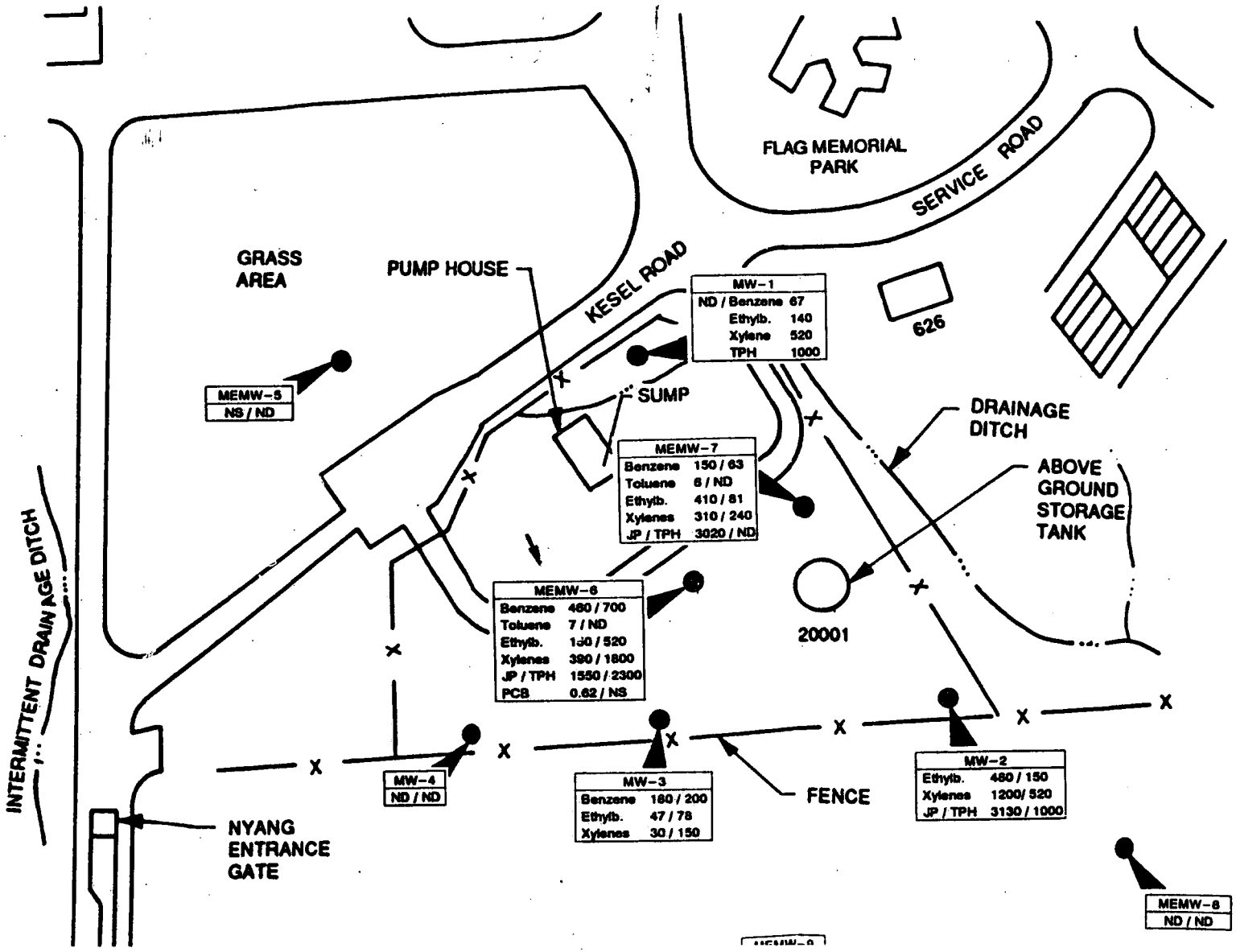
ARAR	Applicable or Relevant and Appropriate Requirement
API	American Petroleum Institute
BTEX	benzene, toluene, ethylbenzene, xylenes
CLP	Contract Laboratory Program
CRQL	Contract Required Quantitation Limit
CS	Confirmatory Study
DD	Decision Document
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DQO	data quality objective
DRO	diesel range organics
EB	equipment blank
EPA	Environmental Protection Agency
FB	field blank
FID	flame ionization detector
HAZWRAP	Hazardous Waste Remedial Actions Program
HASP	Health and Safety Plan
IRP	Installation Restoration Program
JP	Jet Propellant
JP-4	Jet Propellant #4
JP-5	Jet Propellant #5

LIST OF ACRONYMS / ABBREVIATIONS

JP-8	Jet Propellant #8
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
M&E	Metcalf & Eddy, Inc.
MEMW	Metcalf & Eddy monitoring well
MMES	Martin Marietta Energy Systems
MW	monitoring well
µg/L	microgram per liter
MS/MSD	matrix spike/matrix spike duplicate
NET	National Environmental Testing
NGB	National Guard Bureau
NYANG	New York Air National Guard
NYSDEC	New York State Department of Environmental Conservation
PCB	polychlorinated biphenyl
PID	photoionization detector
POL	Petroleum, Oil and Lubricant
ppb	parts per billion
ppm	parts per million
PVC	Polyvinyl Chloride
QC	Quality Control

LIST OF ACRONYMS / ABBREVIATIONS

RI	Remedial Investigation
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SI	Site Investigation
SOW	Statement of Work
TB	trip blank
TFW	Technical Fighter Wing
TPH	total petroleum hydrocarbons
U.S.	United States
VOC	volatile organic compound
WP	Work Plan



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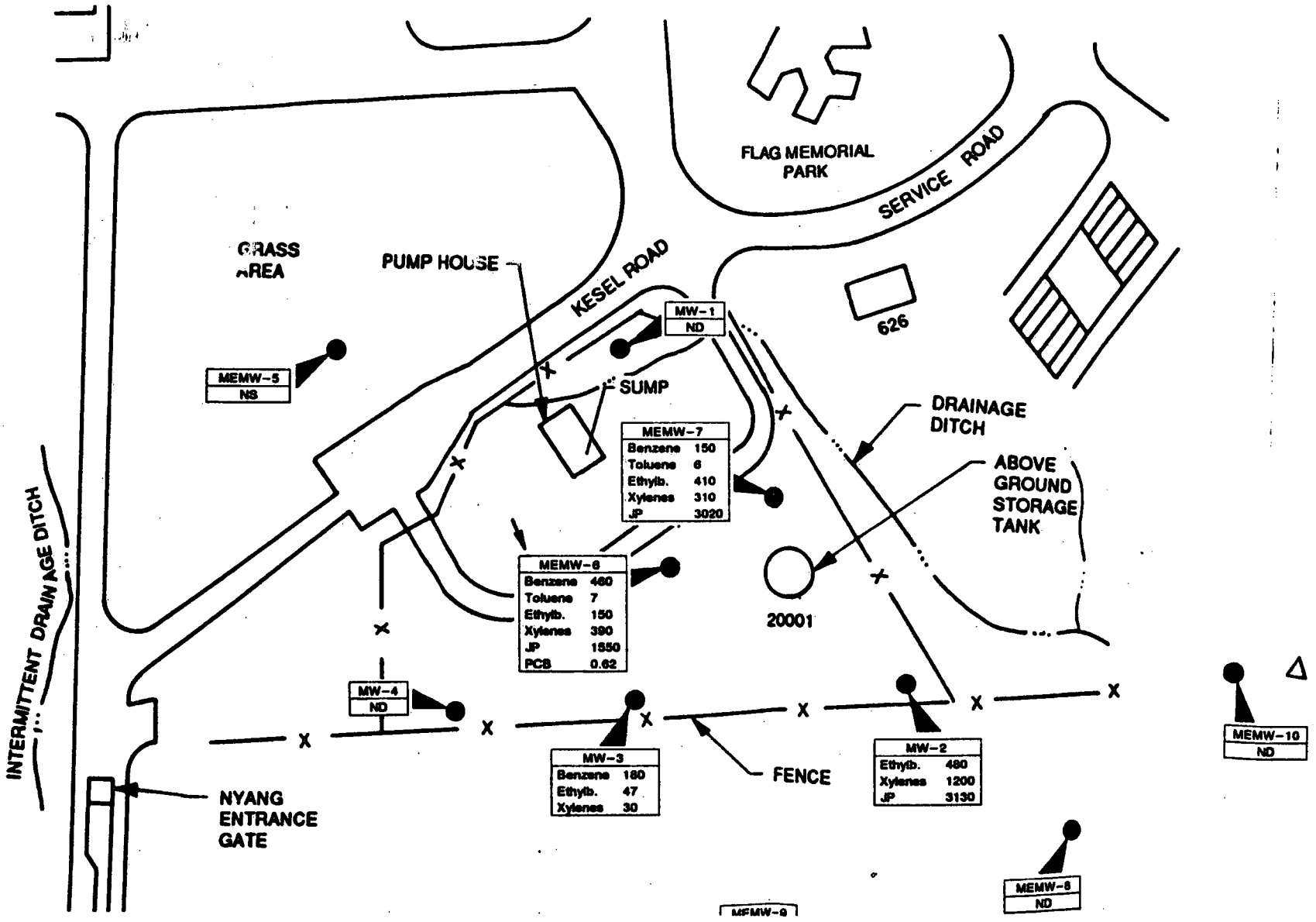

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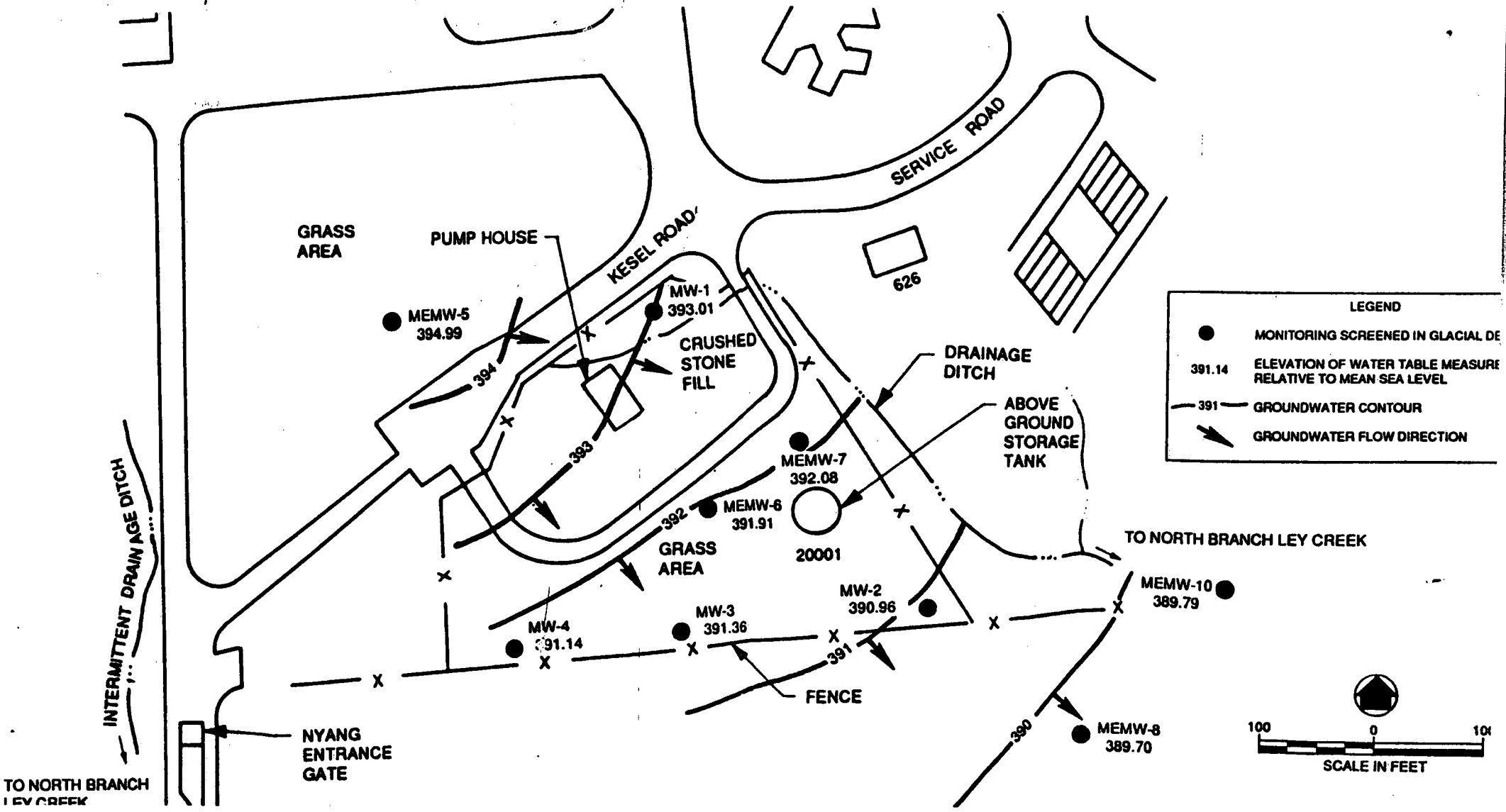
GRASS AREA
PUMP HOUSE
KESEL ROAD
SERVICE ROAD
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MEMW-5
394.99
MW-1
393.01
CRUSHED STONE FILL
DRAINAGE DITCH
ABOVE GROUND STORAGE TANK
MEMW-7
392.08
MEMW-6
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20001
GRASS AREA
TO NORTH BRANCH LEY CREEK
MEMW-10
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MW-2
390.96
MW-3
391.36
MW-4
391.14
FENCE
MEMW-8
389.70
NYANG ENTRANCE GATE
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394
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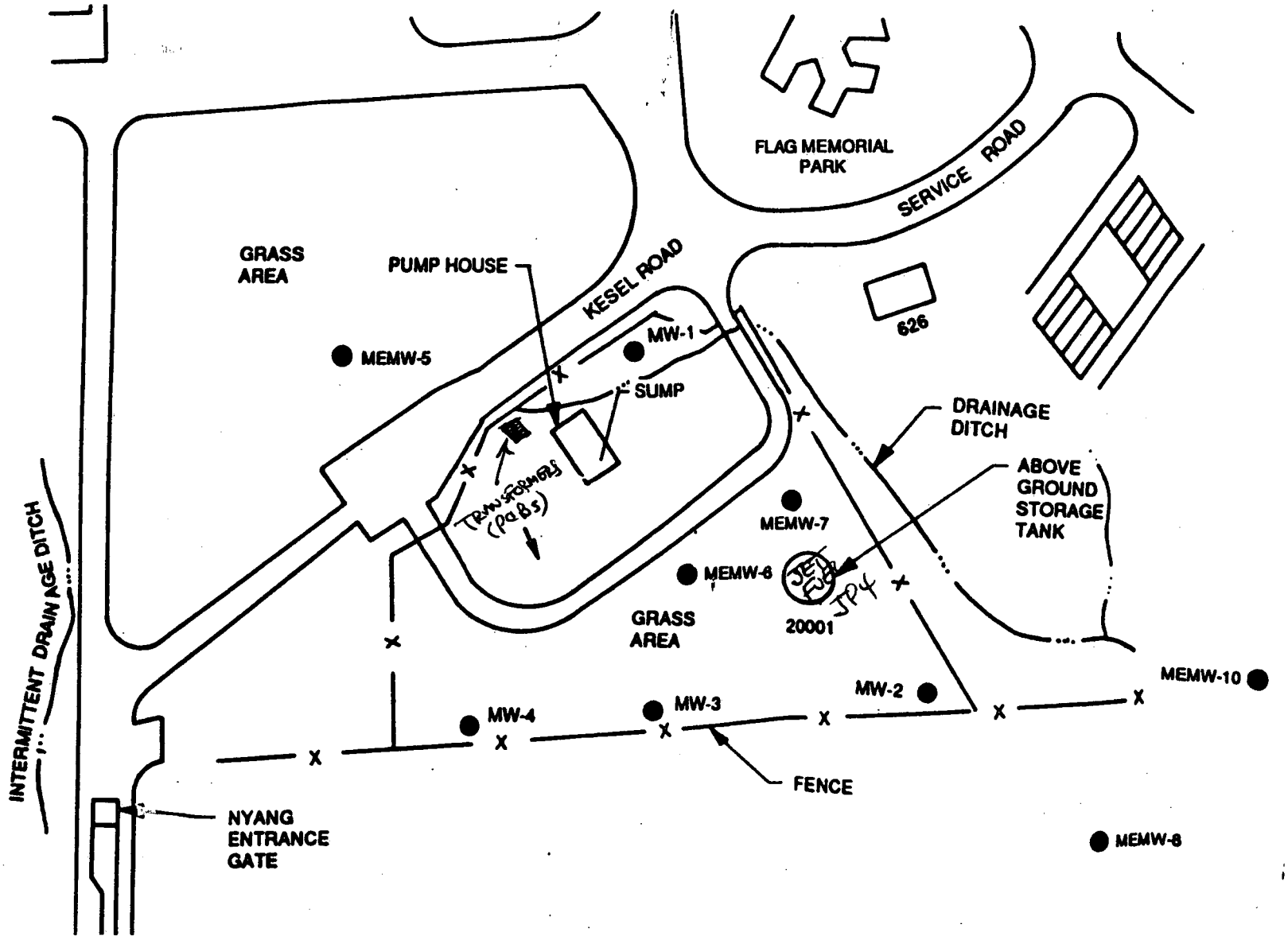
FLAG MEMORIAL PARK
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